

REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

The Applicants' representative would like to thank Examiner Feggins and Supervisory Patent Examiner Barlow for conducting the Interview on April 9, 2002.

Applicants hereby request that the Information Disclosure Statement filed with the Patent Office on February 1, 2002 be considered by the Examiner. Applicants also request that the Examiner return an initialed copy of the PTO 1449 forms which was filed as part of the Information Disclosure Statement of February 1, 2002.

Claims 24-27, 29-31, 34-36, 40, 41 and 46 have been rejected under 35 U.S.C. §102(e) as being anticipated by Kobayashi (US 6,036,299). Claims 28, 32, 33 and 37-39 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi in view of Raman (US 4,730,197). Claims 44 and 45 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi in view of Barrett (US 5,682,191). Claims 42, 43 and 47-50 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi in view of Nakahara (US 6,042,218).

Claims 24, 29 and 34 have been amended in order to further distinguish the present invention from the references applied by the Examiner. As a result, the rejections are submitted to be inapplicable to the amended claims for at least the following reasons.

Claim 24 is patentable over Kobayashi, relied upon by the Examiner, since claim 24 recites an ink-jet recording apparatus having, in part, a flushing signal generating unit operable to generate a flushing signal that causes a recording head to jet only main ink particles through a nozzle so as to not form a mist. Kobayashi fails to disclose a flushing signal generating unit as recited in claim 24.

Kobayashi discloses an ink-jet recording apparatus with a flushing control means 30 that is operable to move recording heads 7 and 8 via a printing control means 20 to a flushing position, which is normally a position opposite caps 12 and 13 of a capping device 11. Once the recording heads 7 and 8 are moved into the flushing position, the flushing control means 30 causes a predetermined number of ink droplets to be ejected from all of the nozzle openings of the recording heads 7 and 8 to prevent clogging of the nozzles. (See column 4, lines 24-38). However, Kobayashi fails to disclose that the flushing control means 30 causes the ink droplets ejected from the nozzle

openings of the recording heads 7 and 8 to only be main ink particles so as to not form a mist, as recited in claim 24.

An advantage of ejecting main ink particles is that they resist the tendency to form a mist of ink particles that can contaminate the ink-jet recording apparatus as a whole due to their size, thereby reducing the ink-jet recording apparatus' print quality. As a result, Kobayashi fails to disclose the invention as recited in claim 24.

Claim 29 is patentable over Kobayashi, relied upon by the Examiner, since claim 29 recites an ink-jet recording apparatus having, in part, a flushing signal generating unit operable to generate a flushing signal that causes a recording head to jet only ink particles with a momentum greater than a predetermined value through a nozzle so as to not form a mist. Kobayashi fails to disclose a flushing signal generating unit as recited in claim 29.

Kobayashi discloses an ink-jet recording apparatus with a flushing control means 30 that is operable to move recording heads 7 and 8 via a printing control means 20 to a flushing position, which is normally a position opposite caps 12 and 13 of a capping device 11. Once the recording heads 7 and 8 are moved into the flushing position, the flushing control means 30 causes a predetermined number of ink droplets to be ejected from all of the nozzle openings of the recording heads 7 and 8 to prevent clogging of the nozzles. (See column 4, lines 24-38). However, Kobayashi fails to disclose that the flushing control means 30 causes the ink droplets ejected from the nozzle openings of the recording heads 7 and 8 to have a momentum greater than a predetermined value so as to not form a mist, as recited in claim 29.

An advantage of ejecting ink particles that have a momentum greater than a predetermined value is that they resist the tendency to form a mist of ink particles that can contaminate the ink-jet recording apparatus as a whole due to their momentum, thereby reducing the ink-jet recording apparatus' print quality. As a result, Kobayashi fails to disclose the invention as recited in claim 29.

Newly added independent claim 34 is patentable over Kobayashi, relied upon by the Examiner, since claim 34 recites an ink-jet recording apparatus having, in part, a flushing signal generating unit operable to generate a flushing signal that causes a recording head to intermittently jet sets of ink particles comprising a main ink jet particle and minute ink jet particles after the main ink jet particle through a nozzle, wherein the minute ink jet particles of a previous set combine with the main ink jet

particle of a following set in a range of a predetermined distance from the nozzle so that an amount of the minute ink jet particles scattered in mist can be reduced. Kobayashi fails to disclose a flushing signal generating unit as recited in claim 34.

Again, Kobayashi discloses an ink-jet recording apparatus with a flushing control means 30 that is operable to move recording heads 7 and 8 via a printing control means 20 to a flushing position, normally a position opposite caps 12 and 13 of a capping device 11. Once the recording heads 7 and 8 are moved into the flushing position, the flushing control means 30 causes a predetermined number of ink droplets to be ejected from all of the nozzle openings of the recording heads 7 and 8 to prevent clogging of the nozzles. (See column 4, lines 24-38). However, Kobayashi fails to disclose that the flushing control means 30 controls the ink droplets ejected from the nozzle openings of the recording heads 7 and 8 to be intermittently jetted through a nozzle such that the ink particles include sets of a main ink jet particle and minute ink jet particles after the main ink particle, and that the minute ink jet particles of a previous set combine with the main ink jet particle of a following set in a range of a predetermined distance from the nozzle so that an amount of the minute ink jet particles scattered in mist can be reduced, as recited in claim 34.

In item 6 of the Office Action, the Examiner contends that Raman discloses a number of the limitations recited in the dependent claims. However, even if the Examiner contention is accurate, Raman provides no suggestion of the above-discussed features of claims 24, 29 and 34.

In item 7 of the Office Action, the Examiner contends that Barrett discloses a fan for preventing the temperature of a recording apparatus from increasing. However, even if the Examiner contention is accurate, Barrett provides no suggestion of the above-discussed features of claims 24, 29 and 34.

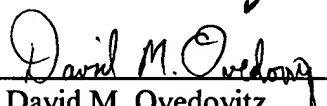
Because of the above mentioned distinctions, it is believed clear that claims 24-50 are allowable over the references relied upon by the Examiner. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 24-50. Therefore, it is submitted that claims 24-50 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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24. (Amended) An ink-jet recording apparatus comprising:
[a flushing signal generating unit operable to generate a flushing signal; and]
a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle [based on the flushing signal, wherein the]; and
a flushing signal generating unit operable to generate a flushing signal that causes said recording head to jet only main ink particles through said nozzle [so that each of the ink particles is a main particle] so as to not form a mist.

29. (Amended) An ink-jet recording apparatus comprising:
[a flushing signal generating unit operable to generate a flushing signal; and]
a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle [based on the flushing signal, wherein the]; and
a flushing signal generating unit operable to generate a flushing signal that causes said recording head to jet only ink particles [through said nozzle so that each of the ink particles has] with a momentum greater than a predetermined value through said nozzle so as to not form a mist.

34. (Amended) An ink-jet recording apparatus comprising:
[a flushing signal generating unit operable to generate a flushing signal; and]
a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle [based on the flushing signal, wherein the]; and
a flushing signal generating unit operable to generate a flushing signal that causes said recording head to intermittently jet sets of [the] ink particles [through said nozzle so that the ink particles include sets of] comprising a main ink jet particle and minute ink jet particles after the main ink jet particle through said nozzle, [the] wherein
the minute ink jet particles of a previous set combine with the main ink jet particle of a following set in a range of a predetermined distance from said nozzle so that an amount of the minute ink jet particles scattered in mist can be reduced.